

**PGCET- CIVIL ENGINEERING**

**Syllabus**

**1. Elements of Civil Engineering and Strength of Materials:**

Force and its types, Concept of equilibrium, Building stones, Bricks, Cement and its properties, Timber and its properties, Columns and Struts, Stress and Mohr's circle, Types of Beams, Bending moment and Shear force, Bending stress and Shear stress, Cylinders, Torsion.

**2. Building Engineering Science:**

Safe bearing capacity, Foundations, Types of Foundations, Footings and types, Cement and its types, Mortar, Reinforced Cement concrete, RMC- manufacture and requirement as per QCI-RMCPCS, High strength concrete, Types of roofs, Lintels and arches, Masonry, Staircase, Trusses, Formwork.

**3. Surveying:**

Chain surveying, Errors in surveying, Omitted measurements, Plane table Surveying, Leveling, Trigonometric surveying, Tacheometric surveying, Contouring, Curves, Calculation of areas and volume.

**4. Fluid Mechanics:**

Different types of fluids and units, pressure, buoyant force, Different types of Flows, Bernoulli's theorem, Discharge Measurements, Orifice, most economical section of the channel, Reynolds's and Froude's number, Model studies, Pressure measuring devices; Notches and Weirs

**5. Structures:**

Three hinged arches & suspension cables. Deflection of beams by Macaulay's method, Moment area method and Conjugate beam method, Rolling loads & influence lines for determinate beams, Analysis of beams by consistent determination method & three moment theorem, Structural analysis by Slope deflection, Moment distribution & Kani's method. Beams; singly, doubly, flanged beams, Slabs; One-way, two way and flat Slabs, Stairs, Columns and column footings (isolated and combined footings), Raft foundation, Steel structures; Analysis and design of tension and Compression members, beams and beam column, column bases, Connections; simple and eccentric, plate girders and trusses, plastic analysis of beams and frames

**6. Geo-technical Engineering:**

Physical properties of soils, water in soils, Stress in soils, Consolidation and settlement, Shear strength of soils, Shallow foundations, Site investigation, Stability of slopes, Earth pressure.

**7. Water Supply and Sanitary Engineering :**

Water demand, Population forecast, Sources of water, Quality of water, Types of pipes, Types of pumps, Water treatment units; sedimentation, aeration, flocculation, filtration, Screening, Pipe joints, Conveyance of Water, Quantity of sewage, Characteristics of Sewage, pH, BOD, COD, DO and others, Sewers, Sewer Appurtenances, Biological treatment, Sewage

treatment units; screening, Grit chamber, Skimming tanks, Detritus tank, Trickling filter, Contact beds, Septic tank, Imhoff tank, ASP, Sewage disposal units, Advance water treatment and waste water treatment methods.

**8. Transportation Engineering:**

Highway Geometric Design: Highway cross-section elements, Sight distance, Design of Horizontal alignment, Design of Vertical alignment. Traffic Engineering: Traffic characteristics, Traffic operation, Pavement materials, Design and evaluation, Rail Gage, Train Resistance, Power of Locomotive, Rails, Sleepers, Curvature of Track, Tunneling of soft soil, Transition curve, Harbour and Dock.

**9. Hydrology:**

Hydrologic cycle, rainfall, unit hydrograph, flood estimation, reservoir design, Well hydraulics.

**10. Irrigation:**

Duty, Delta, Crop water requirements, design of lined and unlined canals, head work, gravity dams and ogee spillways, irrigation methods